

What is claimed is:

1. A light-emitting device comprising:

an electric field receiving member made of a dielectric material;

a first electrode disposed on one surface of said electric field receiving member;

a second electrode disposed on said one surface of said electric field receiving member, said second electrode and said first electrode jointly defining a slit;

an electron passage layer disposed on said first electrode, said second electrode, and said slit, said electron passage layer being resistant to a predetermined voltage when the predetermined voltage is applied thereto, said electron passage layer being made of a material having such characteristics as to pass electrons therethrough;

a fluorescent layer disposed on said electron passage layer; and

a transparent electrode disposed on said fluorescent layer or a third electrode disposed at a predetermined spaced interval from said fluorescent layer.

2. A light-emitting device according to claim 1, further comprising:

an electrically conductive coating layer interposed between said first electrode, said second electrode, and said slit, and said electron passage layer.

3. A light-emitting device according to claim 1,  
wherein at least one of said first electrode and said second  
electrode has at least one of a convexity and a concavity.

5 4. A light-emitting device according to claim 1,  
further comprising at least one of a pinhole defined in at  
least one of said first electrode and said second electrode,  
and a land disposed in said slit in electrically insulated  
relation to said first electrode and said second electrode  
10 and made of a material which is the same as the material of  
said first electrode and said second electrode.

5. A light-emitting device according to claim 1,  
wherein said electric field receiving member has a specific  
15 dielectric constant of 1000 or greater.

6. A light-emitting device according to claim 1,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
500  $\mu\text{m}$ .

20 7. A light-emitting device according to claim 6,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
50  $\mu\text{m}$ .

25 8. A light-emitting device according to claim 7,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
10  $\mu\text{m}$ .

9. A light-emitting device according to claim 8,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
1  $\mu\text{m}$ .

5           10. A light-emitting device according to claim 1,  
wherein said electric field receiving member is made of a  
piezoelectric material, an antiferroelectric material, or an  
electrostrictive material.

10           11. A light-emitting device comprising:  
an electric field receiving member made of a dielectric  
material;

a first electrode disposed on one surface of said  
electric field receiving member;

15           a second electrode disposed on said one surface of said  
electric field receiving member, said second electrode and  
said first electrode jointly defining a slit;

20           a first electron passage layer disposed on said first  
electrode, said second electrode, and said slit, said first  
electron passage layer being resistant to a predetermined  
voltage when the predetermined voltage is applied thereto,  
said first electron passage layer being made of a material  
having such characteristics as to pass electrons  
therethrough;

25           a third electrode and a fourth electrode which are  
disposed on said first electron passage layer, for emitting  
electrons which are emitted from said first electron passage

layer;

a second electron passage layer disposed on said first electron passage layer, said third electrode, and said fourth electrode, said second electron passage layer being resistant to a predetermined voltage when the predetermined voltage is applied thereto, said second electron passage layer being made of a material having such characteristics as to pass electrons therethrough;

a fluorescent layer disposed on said second electron passage layer; and

a transparent electrode disposed on said fluorescent layer or a fifth electrode disposed at a predetermined spaced interval from said fluorescent layer.

12. A light-emitting device according to claim 11, further comprising:

an electrically conductive coating layer interposed between said first electrode, said second electrode, and said slit, and said electron passage layer.

13. A light-emitting device according to claim 11 through 3, wherein at least one of said first electrode and said second electrode has at least one of a convexity and a concavity.

14. A light-emitting device according to claim 11, further comprising at least one of a pinhole defined in at

least one of said first electrode and said second electrode,  
and a land disposed in said slit in electrically insulated  
relation to said first electrode and said second electrode  
and made of a material which is the same as the material of  
said first electrode and said second electrode.

15. A light-emitting device according to claim 11,  
wherein said electric field receiving member has a specific  
dielectric constant of 1000 or greater.

16. A light-emitting device according to claim 11,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
500  $\mu\text{m}$ .

17. A light-emitting device according to claim 16,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
50  $\mu\text{m}$ .

18. A light-emitting device according to claim 17,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
10  $\mu\text{m}$ .

19. A light-emitting device according to claim 18,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
1  $\mu\text{m}$ .

20. A light-emitting device according to claim 11,

wherein said electric field receiving member is made of a piezoelectric material, an antiferroelectric material, or an electrostrictive material.

5           21. A field emission display comprising a two-dimensional array of light-emitting devices, each of said light-emitting devices comprising:

an electric field receiving member made of a dielectric material;

10           a first electrode disposed on one surface of said electric field receiving member;

a second electrode disposed on said one surface of said electric field receiving member, said second electrode and said first electrode jointly defining a slit;

15           an electron passage layer disposed on said first electrode, said second electrode, and said slit, said electron passage layer being resistant to a predetermined voltage when the predetermined voltage is applied thereto, said electron passage layer being made of a material having such characteristics as to pass electrons therethrough;

20           a fluorescent layer disposed on said electron passage layer; and

a transparent electrode disposed on said fluorescent layer or a third electrode disposed at a predetermined spaced interval from said fluorescent layer.

25           22. A field emission display according to claim 21.

further comprising:

an electrically conductive coating layer interposed between said first electrode, said second electrode, and said slit, and said electron passage layer.

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23. A field emission display according to claim 21, wherein at least one of said first electrode and said second electrode has at least one of a convexity and a concavity.

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24. A field emission display according to claim 21 through 15, further comprising at least one of a pinhole defined in at least one of said first electrode and said second electrode, and a land disposed in said slit in electrically insulated relation to said first electrode and said second electrode and made of a material which is the same as the material of said first electrode and said second electrode.

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25. A field emission display according to claim 21, wherein said electric field receiving member has a specific dielectric constant of 1000 or greater.

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26. A field emission display according to claim 21 through 17, wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and 500  $\mu\text{m}$ .

27. A field emission display according to claim 26,

wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and 50  $\mu\text{m}$ .

5 28. A field emission display according to claim 27, wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and 10  $\mu\text{m}$ .

10 29. A field emission display according to claim 28, wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and 1  $\mu\text{m}$ .

30. A field emission display according to claim 21, further comprising:

15 a substrate, said two-dimensional array of light-emitting devices being integrally formed with said substrate.

20 31. A field emission display according to claim 21, wherein said electric field receiving member is made of a piezoelectric material, an antiferroelectric material, or an electrostrictive material.

25 32. A field emission display comprising a two-dimensional array of light-emitting devices, each of said light-emitting devices comprising:

an electric field receiving member made of a dielectric material;



a first electrode disposed on one surface of said electric field receiving member;

a second electrode disposed on said one surface of said electric field receiving member, said second electrode and said first electrode jointly defining a slit;

a first electron passage layer disposed on said first electrode, said second electrode, and said slit, said first electron passage layer being resistant to a predetermined voltage when the predetermined voltage is applied thereto, said first electron passage layer being made of a material having such characteristics as to pass electrons therethrough;

a third electrode and a fourth electrode which are disposed on said first electron passage layer, for emitting electrons which are emitted from said first electron passage layer;

a second electron passage layer disposed on said first electron passage layer, said third electrode, and said fourth electrode, said second electron passage layer being resistant to a predetermined voltage when the predetermined voltage is applied thereto, said second electron passage layer being made of a material having such characteristics as to pass electrons therethrough;

a fluorescent layer disposed on said second electron passage layer; and

a transparent electrode disposed on said fluorescent layer or a fifth electrode disposed at a predetermined

spaced interval from said fluorescent layer.

33. A field emission display according to claim 32,  
further comprising:

5        an electrically conductive coating layer interposed  
between said first electrode, said second electrode, and  
said slit, and said electron passage layer.

34. A field emission display according to claim 32,  
10        wherein at least one of said first electrode and said second  
electrode has at least one of a convexity and a concavity.

35. A field emission display according to claim 32,  
further comprising at least one of a pinhole defined in at  
15        least one of said first electrode and said second electrode,  
and a land disposed in said slit in electrically insulated  
relation to said first electrode and said second electrode  
and made of a material which is the same as the material of  
said first electrode and said second electrode.

20        36. A field emission display according to claim 32,  
wherein said electric field receiving member has a specific  
dielectric constant of 1000 or greater.

25        37. A field emission display according to claim 32,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
500  $\mu\text{m}$ .

38. A field emission display according to claim 37,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
50  $\mu\text{m}$ .

5 39. A field emission display according to claim 38,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
10  $\mu\text{m}$ .

10 40. A field emission display according to claim 39,  
wherein said slit has a width in a range between 0.1  $\mu\text{m}$  and  
1  $\mu\text{m}$ .

41. A field emission display according to claim 32,  
further comprising:

15 a substrate, said two-dimensional array of light-  
emitting devices being integrally formed with said  
substrate.

20 42. A field emission display according to claim 32,  
wherein said electric field receiving member is made of a  
piezoelectric material, an antiferroelectric material, or an  
electrostrictive material.